

KARYAKIN A. V.

Oct 1947

USSR/Chemistry - Protons
Chemistry - Photochemistry

"Phototransfer of Protons, in Organic Systems," Acad A. N. Terenin, A. V. Karyakin, 4 pp

"Dok Akad Nauk SSSR, Nova Ser" Vol LVIII, No 3

Transfer between molecules in organic compounds facilitated as result of the influence of light in the first stages of the photochemical oxidizing-reducing process. Authors describe experiments conducted to study the "interlinked" systems, composed of acid as well as ordinary molecules, united by strong hydrogen bond, and in which the protons to large degree belong simultaneously to both partners of the union. They used colored as well as fluorescent indicators for acidity. Vacuum technique was also used. Submitted, 30 May 1947.

PA 49T1

KARYAKIN, A. V.

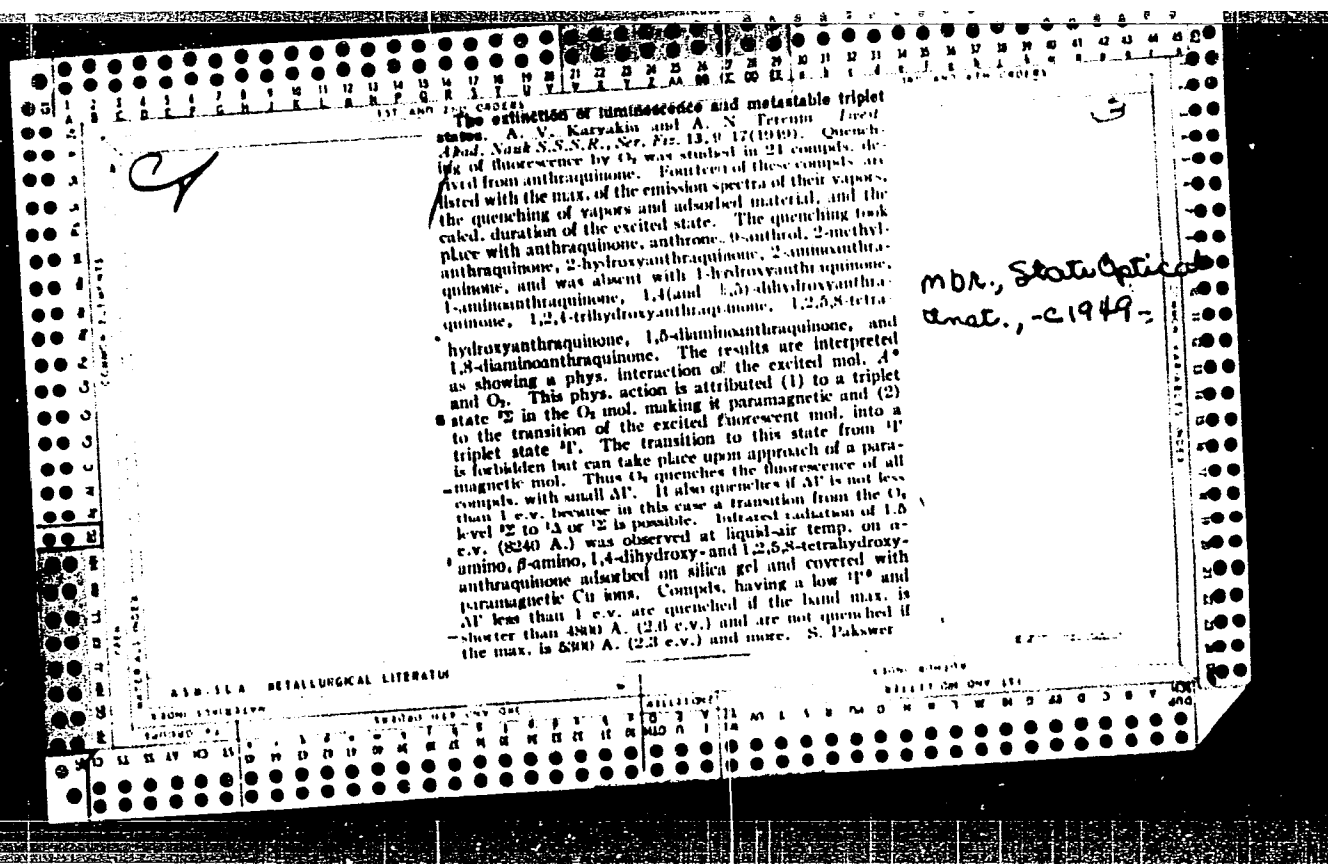
36597. Tusheniye Kislorodom Flvorestsentsii Froizyodnykh Antrakhinona V Iaroodraznom Sostoyanii. (Soobshch.) 1. Zhurnal Fiz. Khimii, 1949, Vyp. 11, c. 1332-44- Bibliogr: 13 Nazv.

SO: Letopis' Zhurnal'nykh Statey, Vol. 50, Moskva, 1949

KARYAKIN, A. V.

36596. Tusheniye Kislorodom Fluorestsentsii Proizvodnykh Antrakhinona I *RAYONBYA z NOLA*
Sostoyanii. (Soobsch.) 2. Zhurnal Fiz. Khimii, 1949, Vyp. 11, c. 1343-56. -
Bibliogr: 11 Nazv.

SO: Letopis' Zhurnal'nykh Statey, Vol. 50, Moskva, 1949



CA

Quenching by oxygen of the fluorescence of anthraquinone derivatives. I. In the vapor state. A. V. Karyakin. *Zhur. Fiz. Khim.* 23, 1332-44(1947); cf. C.A. 43, 7828 c. The maxima λ_1 of absorption in 10^{-4} M alc. solns. and λ_2 of fluorescence in the vapor state were detd. for some anthraquinone derivs. Vapors of 1-hydroxy (λ_1 410 m μ , λ_2 550 m μ), 2-hydroxy (λ_1 375 m μ , λ_2 450 m μ), 1,2-dihydroxy, 1,2,4-trihydroxy (480 m μ , 560 m μ), 1,2,6-trihydroxy, 1-amino (480 m μ , 580 m μ), 1,4-diamino, 1,5-diamino (490 m μ , 560 m μ), 1-chloro, 1,5-dichloro, 1,5-dinitro, 1-nitro-2-methyl, 2-acetamido-3-chloro, and 1,3-dibromo-2-acetamidanthraquinone react with O in darkness at approx. 300° and then cease to fluoresce. 1,4-Dihydroxy (λ_1 480 m μ , λ_2 550 m μ), 1,5-dihydroxy (430 m μ , 560 m μ), 1,2,6,8-tetrahydroxy (400 m μ , 560 m μ), and 1,8-diaminoanthraquinone (505 m μ , 560 m μ), do not react with O and their fluorescence is not quenched by it. The fluorescence of anthraquinone (I) (λ_1 325 m μ , λ_2 480 m μ), anthranol (330 m μ , 450 m μ), anthrone (II) (310 m μ , 470 m μ), 2-aminanthraquinone (III) (450 m μ , 470 m μ), 2-methyl (IV) (340 m μ , 480 m μ), 2-ethyl, and 2-chloroanthraquinone is reversibly quenched by O. These compds. have λ_2 between 450 and 480 m μ , while the compds. not reacting with O have λ_2 near 550-560

m μ . There is no connection between λ_1 and quenching. Petrunin's theory (C. 1, 38, 51-99), though fundamentally correct, must be modified accordingly. The lifetimes of excited II, III, and IV are 5.4×10^{-8} , 1.5×10^{-8} , and 2.3×10^{-8} sec. For I, the curve I_0/I against O pressure seems to consist of 2 branches for which the lifetimes are 1.3 and 9.1×10^{-8} sec. I_0 is the intensity of fluorescence without, and I with O. II. In the adsorbed state. *Ibid.* 1345. The max. λ_2 of fluorescence of vapors adsorbed by SiO₂ was detd. for the same compds. as above; in the same order, λ_2 was 550, 500, 555, 550, 540, 550, 560, 560, 560, 470, 455, 470, 480, and 480 m μ , i.e. very similar to λ_1 . Compds. whose λ_1 is less than 500 m μ showed fluorescence reversibly quenched by O and also afterglow, while the fluorescence of the other compds. was not quenched by O and ceased when irradiation ceased. The lifetime of excited adsorbed moles was 1.8×10^{-8} sec. Irradiation with 360 m μ for 15 min. irreversibly altered the fluorescence spectrum of several compds. The spectra of II and anthranol lost in intensity only, but in those of I, 2-hydroxy, and IV λ_2 shifted to about 550 m μ as well; this long-wave fluorescence was not quenched by O. The ratio I_0/I was proportional to the O pressure, except for I and II, whose curves seemed to consist of 2 branches. I. J. Bickerman

KARYAKIN, A. V.

PA 50/49T91

USSR/Physics
Molecular Spectra

Mar 49

"Duration of the Excited State in Molecules of Anthraquinone Derivatives in Vapors and Adsorbates," A. V. Karyakin, M. D. Galanin, 3 3/4 pp

"Dok Ak Nauk SSSR" Vol LXVI, No 1

Agreement of values obtained by different methods shows that average duration of an excited state in molecules of anthraquinone derivatives (except beta-methyl anthraquinone) has the same value for vaporous and adsorbed states. Each collision of an excited molecule with oxygen is effective.

Submitted by Acad A. N. Terenin, 11 Mar 49.

50/49T91

KARYAKIN, A. V.

USSR/Physics
Luminescence
Anthracene

May 49

"Infrared Luminescence of Adsorbates of Anthra-
quinone Derivatives," A. V. Karyakin, Ye. I.
Kalenichenko, 3 pp

"Dok Ak Nauk SSSR" Vol LXVI, No 2

Acad A. N. Terenin has suggested that in all
aromatic compounds, including anthraquinone
derivatives, there must exist a triplet level
at an approximate level of 1.5 ev as in the
case of benzene and naphthalene. Describes
experiments to prove existence of the postulated
52/49T102

May 49

USSR/Physics (Contd)

level. Anthraquinone derivatives were adsorbed
on silica gel, surface of which was covered
with paramagnetic ions of bivalent copper.
Adsorbates were cooled with liquid air, and sub-
jected to infrared radiation. Results show
postulated level exists at a level of 1.4 ev
and not 1.5 ev. Submitted by Acad A. N. Terenin,
11 Mar 49.

52/49T102

KARYAKIN, A. V.

PA 54/49T100

Jul 49

USSR/Physics
Fluorescence
Anthraquinone Derivatives

"Quenching the Fluorescence of Anthraquinone Derivatives in Vapor and Adsorbates by Nitric Oxide," A. V. Karyakin, Acad A. N. Terenin, Ya. I. Kalenichenko, 4 pp

"Dok Ak Nauk SSSR" Vol LXVII, No 2

Gives table showing strong quenching in vapor and adsorbates of anthraquinone, beta-ox- and beta-amino-anthraquinone, and in adsorbates of beta-methyl-anthraquinones. In other derivatives there is either an ignition of fluorescence or no reaction. Submitted 16 Apr 49.

54/49T100

KARYAKIN, A. V.

USSR/Chemistry - Acridine, Amino
Absorption Spectra
1 Aug 49

"Problem of Structure of 9-Aminoacridine," A. V. Karyakin, A. M. Grigorovich, N. G. Yaroslavsky, 4 pp

"Dok Ak Nauk SSSR" Vol LXVI, No 4

Unlike other aminoacridines, 9-aminoacridine and its derivatives, 9-aminoacridine, possess great bactericidal activity. Previous efforts to show that their characteristic were related to their structure and that they did not have the same structure (A) but the tautomeric structure

3/50113

USSR/Chemistry - Acridine; Amino
(Contd)
1 Aug 49

of acridine (B) were investigated. Study of the absorption spectra in ultraviolet and visible spectral fields makes the latter hypothesis reasonable. Data on infrared absorption spectra confirm the assumption that a 9-aminoacridine molecule has the structure of (B). Submitted by Academician N. Terent'ev 2 Jan 49.

3/50113

USSR/Chemistry - Indicators
Solidification

11 Sep 49

"Color Reaction of Indicators on Solidification of Organic Melts," Acad A. N. Terent'ev, A. V. Karyakin, 4 pp

"Dok Ak Nauk SSSR" Vol LXVIII, No 2

Introduced several drops of saturated solutions of indicators (phenolphthalein, cyanin hydrochloride, etc.) in acetic, methyl red, acridine hydrochloride, etc.) in absolute alcohol, benzene, toluol, carbon tetrachloride, and chloroform into dried, weighed portions of powders of carbamide, acetamide, benzoic acid, benzoic acid, mannite, and piperazine. Noted

3/5019

11 Sep 49

USSR/Chemistry - Indicators (Cont'd)

no appearance of change of color to indicate cleavage of a proton from an indicator molecule, e.g. phenolphthalein solution in fused carbamide was colorless. However, at first moment of solidification, an intensive raspberry color appeared (typical for formation of a phenolphthalein molecule lacking two H⁺ of a phenolphthalein group OH). Experiments show it possible to use color indicators to expose transient, unstable states of solid organic media in crystallization process. Submitted 11 Jul 49.

3/5019

KARYAKIN, A. V.

CA

Sensitized fluorescence in vapors of organic compounds.
A. N. Terenin and A. V. Karyakin. *Izv. Akad. Nauk S.S.S.R., Ser. Fiz.* 15, 530-5 (1951).—A mixt. of naphthalene and acridine vapor was examd. The lines emitted by a Mg spark (2783-2784 Å.) correspond to an absorption band of naphthalene (2784 Å.) and to a min. in the absorption of acridine. Thus the violet fluorescence of pure acridine vapor does not appear upon excitation with a Mg spark at pressures of 5-100 mm. (100-250°). However, when a beam of naphthalene vapor of 0.1-mm. pressure and higher is injected into acridine vapor of 60 mm. pressure and up, fluorescence appears along the naphthalene beam, particularly strong at 200 mm. acridine (300°) and 4-10 mm. naphthalene (75-90°) pressure. O quenches naphthalene but does not quench acridine fluorescence; however, in case of mixt., the sensitized fluorescence of acridine is quenched by O.
S. Pakswar

1. KARYAKIN, A. V., NIKITIN, V. A.
2. USSR (600)
4. Fluorescence
7. Fluorescent method of defectoscopy of surfaces and determination of depth of cracks. Izv. AN SSSR. Ser. fiz. 15, no. 6, 1951.

9. Monthly List of Russian Accessions, Library of Congress, January, 1953. Unclassified.

KAR, TANZI, A.V.

Effect of adsorption of water on the quenching of the fluorescence of adsorbates: A. N. Terenin and A. V. Karavakin. *Zhur. Ekspil. Teord. Fiz.* 21, 107-113 (1963). *Chem. Abstr.* 6085d, 7829h; 44, 2853f. Adsorbates of anthraquinone (I) were prep'd. on purified silica gel by adsorption from the vapor at about 240°; the adsorbed I is held firmly and is not given up on heating to a temp. somewhat higher than the temp. of prep'n. Fluorescence was investigated in excitation with ultraviolet. Quenching by O_2 as a function of its pressure p , follows the linear law $I_0/I_p = 1 + kp$, where k contains the probability of quenching on collision between adsorbed I and gaseous O_2 . Exptl. plots of I_0/I_p as a function of p , at 20, 0, and -70°, consist of 2 linear branches of different slopes; up to $p \approx 50$ mm., the quenching is slight, and from 50 mm. upwards (to 120 mm.) the line bends over with a markedly steeper slope, increasing with the temp. The calcd. collision efficiency increases from 0.5 at -70° to 0.8 at 0°, if the efficiency at 20° is assumed = 1. This indicates an addnl. activation energy for quenching of the order of 3 kcal./mole. The 2-stage character of the quenching is reproduced reversibly along decreasing p , and, consequently, is not det'd. by any chem. change of I. At -180°, the quenching becomes exceedingly strong; thus, under $p = 1$ mm., the intensity of the fluorescence falls to 50%, and is suppressed altogether on further slight increase of p , whereas at -76°, 60 mm. O_2 is needed to decrease the intensity by 50%. At -180°, the original intensity is restored only upon prolonged evacuation of the O_2 . At that

temp., the quenching is brought about, not by impact of gaseous O_2 , but by adsorbed O_2 . The 2-stage dependence of the quenching on p disappears, and is superseded by a single k , when the adsorbate has been treated with H_2O vapor under 15 mm. at 20° and the excess H_2O pumped off in high vacuum at 250-300°; under these conditions, there is a considerable increase of the no. of firmly held OH groups on the surface of the silica gel, as shown by infrared spectra. The fluorescence spectrum of the H_2O -treated adsorbate re-

mains unchanged, but quenching by O_2 is enhanced, and varies with p along a single straight line. In further contrast to the untreated adsorbate, lowering the temp. from 20° to -70° increases the quenching of the fluorescence of the H_2O -treated adsorbate; at -180°, the treated adsorbate shows even stronger quenching by O_2 than does the untreated. That the H_2O mol's. themselves do not influence the anomalous course of the quenching follows from the fact that quenching by O_2 of vapor-phase I at 220° remains 2-stage even in the presence of 15 mm. H_2O . Evidently, treatment with H_2O increases very strongly the adsorption of O_2 , so that quenching, at all temps., takes place predominantly through adsorbed O_2 . The surface concn. of adsorbed O_2 increases with decreasing temp., and this effect evidently prevails over the contrary temp. dependence of the collision efficiency of quenching by impinging gaseous mol's. The strong adsorption of O_2 following treatment with H_2O vapor was demonstrated by infrared spectra of microporous glass; adsorption of either O_2 or N_2 at -180° under 1 atm. resulted in a weakening of the 1.105- μ band of OH and its shift by 0.011 μ ; but while this change could be easily annulled by evacuation in the case of N_2 , it required prolonged pumping and even heating with O_2 . The observations are interpreted by a scheme in which collisions of O_2 with excited I^* lead to the formation of an unstable photoproduct ($I \cdot O_2$) which may decomp. back into I^* and O_2 (with p), or else convert its excitation energy into latent, vibrational (sign \sim , path q): $I^* + O_2 \xrightarrow{p} (I \cdot O_2)^* \xrightarrow{q} I + O_2$. Path q will predominate over the reverse path p if there is a strong probability for ($I \cdot O_2$)^{*} to undergo perturbation through another gaseous O_2 mol. (as paramagnetic agent), i.e. under high O_2 pressure, or through the vicinity of an adsorbed O_2 mol. The role of an adsorbed paramagnetic substance was confirmed by exptl. with an adsorbate of I on silica gel preliminarily impregnated with $CuSO_4$. Adsorbed Cu^{++} ions had a 2-fold effect. The intensity of the fluorescence was lowered, and its quenching by O_2 was 1-stage, exactly as on H_2O -treated silica gel. The role of the latter treatment is thus shown to consist in increased adsorption of O_2 , acting as paramagnetic agent.

N. Dan

KARYAKIN, A. V.

Acridine Derivatives

Absorption spectra of acridine derivatives in the dissolved or adsorbed state. Zhur.fiz. khim
26 no. 1. '52.

Monthly List of Russian Accessions, Library of Congress, September 1952, Unclassified.

KARYAKIN, A. V.

② Phys. Chem.

Phosphorescence of 2-hydroxyanthraquinone. A. V. Karyakin and Ya. I. Kalenichenko. *Zhur. Fiz. Khim.* 26, 103-6 (1952); cf. C.A. 43, 6088h. — The search for a short-lived phosphorescence, of the order of a fraction of a sec., gave a pos. result only with an adsorbate of 2-hydroxyanthraquinone (I) on silica gel, among more than 20 anthraquinone derivs. tested. The observed phosphorescence (slow fluorescence) at room temp. had a life of the order of 10^{-3} sec. In contrast to other β -derivs. of anthraquinone, I did not show any long-lived phosphorescence (of the order of a few sec.). The short-lived phosphorescence is quenched reversibly by O_2 under pressures of a few hundredths of a mm. and higher. At liquid-air temp., too, only I exhibits the short-lived phosphorescence, but at that temp. long-lived phosphorescence also appears. Solidified melts of I with urea give only the long-lived effect, both at room and at liquid-air temp. It appears that I has 2 metastable levels, of which the one responsible for the short-lived effect lies very close to the excited levels, possibly as close as 0.01 e.v., whereas the level responsible for the long-lived effect lies at

about 0.1 v. Possibly, the 1st level is not a triplet level.
N. Thon

8/30/54

PA 239T30

KARYAKIN, A. V.

USSR/Chemistry - Adsorption

Aug 52

"The Change in the Infrared Absorption Band of OH in Microporous Glass During Low-Temperature Adsorption of Oxygen and Nitrogen," N. G. Yaroslavskiy and A. V. Karyakin

"DAN SSSR" Vol 85, No 5, pp 1103-1106

The presence of OH groups on the surface structure of adsorbents affects the adsorption activity of the surface. A piece of microporous glass was placed under vacuum in a glass of water and the adsorption spectra measured after either O or N were

239T30

admitted to the vacuum. Cooling to -180° shrinks the OH group band at 1.365 microns. On admission of N, the intensity starts to decrease at the usual absorption peak of 1.365 microns, and increases at 1.378 microns. On admission of O, the usual OH peak immediately disappears. Submitted by Acad A. N. Terenin 26 May 52.

239T30

KARYAKIN, A. V.

USSR/Physics - Infrared Spectra,
Peroxides Sep/Oct 53

"Infrared Absorption Spectra of Organic Peroxides and
Their Manifestation in Photo-Oxidation," A. V. Kary-
kin and V. A. Nikitin

Iz Ak Nauk, Ser Fiz, Vol 17, No 5, pp 636-643

Investigates exptly infrared absorption spectra of
liquid and solid org peroxides. Tabulates data on 16
peroxides and applies results to study of reactions
of photooxidation of benzaldehyde, toluol, ethyl ben-
zene, isopropylbenzene, pinene and myrcene. Expts
were guided by A. N. Terenin.

274798

A-V.
KARYAKIN, ~~V. A.~~

USSR/Chemistry - Peroxides, organic

Dec 53

"Infrared Spectra of Peroxides," A. V. Karyakin,
V. A. Nikitin, K. I. Ivanov

Zhur Fiz Khim, Vol 27, No 12, pp 1856-66

Detd the typical infrared spectrum frequencies for
the peroxide groups COOH and COOC.

275T15

KARYAKIN, A. V.

USSR/Physical Chemistry - Photochemistry. Radiation Chemistry. Theory of the Photographic Process, B-10

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 61105

Author: Karyakin, A. V., Nikitin, V. A.

Institution: None

Title: Spectral Investigation of Photooxidation of Organic Compounds

Original

Periodical: Zh. fiz. khimii, 1953, 27, No 12, 1867-1876

Abstract: Use of previously obtained data on infrared spectra of some organic peroxide compounds (Referat Zhur - Khimiya, 1956, 46040) made it possible to apply the method of infrared spectroscopy for the detection of intermediate products of the reaction of photooxidation with oxygen, of benzaldehyde (I), isopropylbenzene (II), pinene (III) and myrcene (IV). Toluene and ethylbenzene are not oxidized under the conditions of the experiment. On oxidation of I (25% solution in CCl_4 , time of illumination: 1 hour) the following spectral changes were noted: disappears band $7,940 \text{ cm}^{-1}$ -- second

Card 1/3

USSR/Physical Chemistry - Photochemistry. Radiation Chemistry. Theory of the Photographic Process, B-10

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 61105

Abstract: overtone valency oscillation $\text{CH}(\text{al})$; appears new band $6,250 \text{ cm}^{-1}$ -- first overtone valency oscillation O-H ; appears band $6,250 \text{ cm}^{-1}$ first overtone hydrogen bond $\text{OH}\dots\text{O}$; considerable reduced band $5,650 \text{ cm}^{-1}$ -- first overtone $\text{CH}(\text{al})$; appears band 875 cm^{-1} -- main frequency valency oscillation O-O ; band pertaining to benzene ring are not changed, while band of carbonyl group $\text{C}=\text{O}$ is shifted from $1,715$ to $1,680 \text{ cm}^{-1}$. These changes indicate that aliphatic group CH is replaced by peroxide group O-O-H with formation of hydrogen bond with group $\text{C}=\text{O}$, and this hydroperoxide is unstable; after 24 hour standing of oxidized solution in its spectrum disappears 875 cm^{-1} and the spectrum is converted to a set of frequencies of I and benzoic acid. Absence of band 837 cm^{-1} characteristic of hydroperoxide chain C-O-O-H is due to formation of hydroperoxide I with appearance of band 875 cm^{-1} characteristic of group O-O . On the basis of comparison of experimental material on spectroscopy of I frequencies $1,200$ and $1,309 \text{ cm}^{-1}$ in spectrum of I are related to oscillations of carbonyl group in excited state with open π -bond. Oxidation of II results in appearance of a set of frequencies

Card 2/3

USSR/Physical Chemistry - Photochemistry. Radiation Chemistry. Theory of the
Photographic Process, B-10

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 61105

Abstract: characteristic of hydroperoxide. For III consisting of α - and β -
fractions formation of hydroperoxides on photooxidation is proved
by occurrence of bands: 844 cm^{-1} (OOH), $3,390\text{ cm}^{-1}$ (OH), $6,410\text{ cm}^{-1}$ ($2\nu\text{OH}$), considerable widening and shift of latter band in
relation to its usual position ($6,900\text{ cm}^{-1}$) is due to formation
of strong hydrogen bond. Band $1,695\text{ cm}^{-1}$ ($\text{C}=\text{O}$) appertains to
products of decomposition of hydroperoxides, appearance of band
 722 cm^{-1} so far cannot be explained. Appearance in infrared
spectrum of IV (after 4 hours of illumination) of bands 833 and
 $3,580\text{ cm}^{-1}$ indicates the formation of hydroperoxide, while band
 $1,710\text{ cm}^{-1}$ indicates presence of compounds containing the group
 $\text{C}=\text{O}$. The hydroperoxide formed is little stable, its concen-
tration is low and it decomposes rapidly with formation of
carbonyl-containing compounds and H_2O .

Card 3/3

KARYAKIN, A. V.
USSR/Miscellaneous - Production Quality

Card 1/1

Authors : Karyakin, A. V., and Nikitin, V. A.

Title : Luminescent analysis in national economy

Periodical : Priroda, 5, 87 - 92, May 1954

Abstract : Methods of investigating or discovering of various objects by means of fluorescence (or any other form of luminescence) were combined under one general name "luminescent analysis". The fluorescent method of defectoscopy is now in use by many Soviet industries, in plant laboratories, technical control offices etc. The luminescent analysis method made it possible to reduce the number of factory rejects and to improve the technology and quality of products. The introduction of the great scientific achievements in the field of fluorescence and luminescence into the national economy serves as a lustrous example of the creative cooperation between science and industry. Photos of objects to which the luminescent analysis method can be applied are included.

Institution :

Submitted :

KARYAKIN, A. V.

USSR/Chemistry - Photo-Chemical reactions

Card 1/1 : Pub. 118 - 3/9

Author : Karyakin, A. V.

Title : Spectral analysis of photo-chemical reactions developed by powerful light flows

Periodical : Usp. fiz. nauk 53/3, 413-432, July 1954

Abstract : A pulsating-light method, based on the application of a powerful light lamp, is described. The method was used in detecting free radicals (which are defined). The method, however, helped not only in detecting free electrons, but also in observing and studying reactions caused by the latter. Thirty-one references. (1928-1953). Diagrams; illustrations; tables; graphs.

Institution : ...

Submitted : ...

U S S R

Energy transfer in sensitized fluorescence of mixtures of vapors of organic compounds. A. N. Terenin and A. V. Karyakin. *Doklady Akad. Nauk S.S.S.R.* 90, 259-261 (1954); cf. *C.A.* 46, 8971d. Acridine vapor (I) in equilibrium with solid at 100-250° in a quartz bulb surrounded by naphthalene vapor (II) did not fluoresce under excitation by a Mg spark (2783-2760 Å). Injection of benzene or toluene vapor into I did not produce fluorescence under the Mg spark nor intensify the fluorescence under a Hg lamp (around 3130 Å). The fluorescence of I when mixed with II therefore results from excitation by collision with an excited naphthalene mol., not from absorption of the fluorescence light emitted by naphthalene nor from the effect of transparent foreign gases (cf. Neporent, *C.A.* 34, 4663²). Naphthalene-sensitized fluorescence was also observed for the vapors of 2-amino-, 3-hydroxy-, and 3-methylaminophthalimide, as well as indigo, Al-8-quinolinolate, and Mg phthalocyanine. The last 3 compds. volatilize with such difficulty that fluorescence of their vapors, alone or mixed with benzene but in the absence of naphthalene, cannot be seen under either the Mg spark or the Hg lamp. Gordon C. Evans

Karyakin, A.V.

V. Influence of condensing oxygen on the fluorescence and absorption spectra of anthraquinone derivatives in the adsorbed state. A. V. Karyakin and A. N. Terent'ev. Dokl. Akad. Nauk S.S.S.R. 97, 42 (1954).—Studying the initial stages of the ads. of O and its interaction with moles. of numerous derivs. of anthraquinone and acridine, led to an investigation of the blocking out of the fluorescence of these compounds in the gaseous and in the adsorbed states. It was found that for anthraquinone derivs. there is a sharp selectivity in blocking out fluorescence by use of gaseous O, depending on the location of substituents. Thus for ex-

ample, 2-derivs. experience a strong blotting out of fluorescence; while 1-derivs. do not experience any or only a slight one. This is shown for anthraquinone, 1-aminanthraquinone, and 2-aminanthraquinone, at 5 sets of conditions with O varying from vacuum to 100 mm. Hg, and temps. from +20 to -180°. Absorption spectra were measured by use of a differential attachment to the glass monochromator with photoelec. registration of the light. As a check, it was found that condensing O or N at -180° decreased passage through a glass disk filter (with micro-pores) proportionally for the whole spectrum by 5-10%.

V. H. Gottschalk

KARYAKIN, A.V.

ZALENSKIY, O.V.; SEMIKHATOVA, O.A.; VOZNESENSKIY, V.L.; KONOVALOV, I.N.,
redaktor; YAKOVLEVA, V.M., redaktor; KARYAKIN, A.V., redaktor;
ABONS, R.A., tekhnicheskiy redaktor. ~~_____~~

[Using radioactive carbon C¹⁴ in the study of photosynthesis]
Metody premeneniia radioaktivnogo ugleroda C¹⁴ dlia izucheniia
fotosinteza. Moskva, Izd-vo Akademii nauk SSSR, 1955. 88 p.
(Photosynthesis) (MLRA 8:11)
(Carbon--isotopes)

KARYAKIN, A. V.

AUST

Spectroscopy in the infrared of molecules adsorbed on porous glass. A. N. Terebin, N. G. Yezhovskii, A. V. Karyakin, and A. T. Sidorova (Univ. Leningrad). Sov. Chem. 1955, 40/7-70. The inner surface of the pores of silica gel, especially in the modification known as porous glass, is covered by structurally isolated hydroxyl groups, characterized by small infrared bands if the surface is freed of foreign mol. by careful, continuous evacuation accompanied by heating to about 600°. When the vapors of various org. and inorg. compds. are adsorbed, the vibration frequency and intensity of these bands are altered characteristically; this may often be ascribed to a H bonding with the adsorbed mol. On the other hand, the infrared spectrum of the adsorbed mol. itself is obtained, although it is somewhat modified as a result of the action of the surface. The method can be of service since it makes possible a selective enrichment of a dil. material. W. T. Hall

PDW

Card 1/1

- 159 -

1150 11,

ARKADY VASIL'YEVICH KARYAKIN
KARYAKIN, Arkadiy Vasil'yevich, kand.tekhn.nauk; TYUMENEVA, S.T., insh.,red.;
FREGER, D.P., tekhn.red.

[Luminescent defectoscopy] Liuminestsentnaia defektoskopiia.
Leningrad, 1956. 15 p. (Leningradskii dom nauchno-tekhnicheskoi
propagandy. Informatsionno-tekhnicheskii listok, no.17. Kontrol'
kachestva produktsii) (MIRA 10:12)
(Ultraviolet rays--Industrial applications)

KARYAKIN, A. V.

USSR/Photochemistry. Radiation Chemistry. Theory of Photographic Process. B-10

Abs Jour : Ref Zhur - Khimiya, No 8, 1957, 26261

Author : A.N. Terenin, A.V. Karyakin, Ye.B. Lyubomudrov, O.D. Dmitriyev-skiy, P.E. Sushinskiy

Title : Alterations of Spectra of Phthalocyanins in Solutions under Action of Powerful Light Impulses.

Orig Pub : Optika i spektroskopiya, 1956, 1, No 4, 456-462

Abstract : Solutions of phthalocyanins (Ph) of Mg, Zn, Fe, Cu and Co in alcohol, acetone, ether, pyridine and toluene (10^{-4} to 10^{-5} M) were liberated of O_2 by vacuum treatment and illuminated with an impulse bulb ISS-250 (flash energy 250 joules, flash duration 10^{-3} to 10^{-4} sec.). The spectra in the range of 0.5 to 0.9μ were photographed with a spectrograph ISP-51. Either the impulse bulb itself, or another impulse bulb lighted by a time relay switch 2×10^{-5} to 2.1 sec. after the flash of the first bulb served as the light source. PhMg and PhZn are subject to a short-duration (from 0.8 to 1×10^{-3} sec. in case of PhMg) discoloration under the action of a flash. The discoloration of PhMg and PhZn is completely eliminated by letting

Card : 1/2

KARYAKIN, A. V.

AID P - 4230

Subject : USSR/Heat and Power Engineering
Card 1/1 Pub. 110 a - 11/15
Author : Karyakin, A. V., Eng.
Title : Experiments on detecting defects by a luminescent method in routine repair work on steam turbines.
Periodical : Teploenergetika, 3, 54-55, Mr 1956
Abstract : The use of fluorescent coating for defect detection as used in the steel industry is explained. Some instances of using this method in turbine repair work are reported.
Institution : None
Submitted : No date

KARYAKIN, A.V.

USSR/Physical Chemistry - Surface Phenomena. Adsorption. Chromatography. Ion Exchange, B-13

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 61209

Author: Nikitin, V. A., Sidorov, A. N., Karyakin, A. V.

Institution: None

Title: Investigation of the Adsorption of Ordinary and Heavy Water on Microporous Glass by Means of Infrared Absorption Spectra

Original

Periodical: Zh. fiz. khimii, 1956, 30, No 1, 117-128

Abstract: Measured were infrared absorption spectra of microporous glass (MG), in the frequency interval $2,000-10,000\text{ cm}^{-1}$, after adsorption thereof of vapors H_2O and D_2O . In the case of H_2O in the previously not investigated region of basic frequencies of valence oscillations of OH groups ($3,100-3,800\text{ cm}^{-1}$) there are observed the bands $3,749$ (free OH of MG surface) and $3,450\text{ cm}^{-1}$ (molecules of liquid or capillary condensed H_2O). In the case of D_2O there are observed the bands $2,761$, $2,725$ (of adsorbed HOD $2,676\text{ cm}^{-1}$, respectively).

Card 1/2

Card 2/2

KARYAKIN, A. V.

USSR/Physical Chemistry - Photochemistry.

B-10

Radiation Chemistry. Theory of the Photographic Process

Abs Jour : Referat Zhur - Khimiya, No 2, 1957, 3881

Author : Karyakin A.V.

Title : Photoreaction of Reversible Fading of Dyes Adsorbed at Microporous Glass

Orig Pub : Zh. fiz. khimii, 1956, 30, No 5, 986-994

Abstract : On illumination in the region of the principal absorption band of methylene blue (660 m μ), adsorbed at microporous glass, the adsorbate is decolorized within 10 minutes; a slight absorption persists at 630 m μ and the band at 310 m μ is fully retained. On exposure to O₂ there is observed, in the dark, a complete restoration of the blue coloration of the dye, which indicates the formation of a leuco-form by the action of the hydroxyl groups of the glass. The author assumes that during the illumination as a result of a heating by the light, a

Card: 1/2

- 161 -

KARYAKIN, A.V.; LAZAREV, D.N.; BARINOVA, G.A.

Fluorescent analysis of the viability of agricultural plant.
seeds. Dokl.AN SSSR 106 no.4:739-742 P '56. (MIRA 9:6)

1.Predstavleno akademikom A.L.Kursanovym.
(Seeds)

KARYAKIN, A.V.

PRIKHOTKO, A.F.
24(7) p 3 PHASE I BOOK EXPLOITATION SOV/1365
L'vov. Universitet
Materialy I Vsesoyuznogo soveshchaniya po spektroskopii. t. 1: Molekulyarnaya spektroskopiya (Papers of the 10th All-Union Conference on Spectroscopy. Vol. 1: Molecular Spectroscopy) [L'vov] Izd-vo L'vovskogo univ-ta, 1957. 499 p. 4,000 copies printed. (Series: Its: Fizichnyy zbirnyk, vyp. 3/8/)
Additional Sponsoring Agency: Akademiya nauk SSSR. Komissiya po spektroskopii. Ed.: Uzer, S.L.; Tech. Ed.: Saranyuk, T.V.; Editorial Board: Landberg, G.S., Academician (Resp. Ed., Deceased), Naporent, B.S., Doctor of Physical and Mathematical Sciences, Pabelinskiy, I.L., Doctor of Physical and Mathematical Sciences, Koritak, V.G., Candidate of Technical Sciences, Rayskiy, S.M., Candidate of Physical and Mathematical Sciences, Klimovskiy, L.K., Candidate of Physical and Mathematical Sciences, Millyanchuk, V.S., A. Ye., Candidate of Physical and Mathematical Sciences.

Card 1/30

Rakov, A.V. Dependence of the Line Width in Raman Spectrum on the Aggregate State of the Substance 229
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Pavlovskaya, T. Ye., and A.G. Pasynskiy. Variation in Absorption Spectra of Protein Solutions Due to Ionizing Radiation in Air and in Vacuum 235
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Karyakin, A.V., and A.V. Shabliya. Infrared-spectrographic Study of the Sensitization of the Photo-oxidation of Organic Compounds by Means of Anthraquinone Derivatives 243

Card 16/30

State OL
Optical Inst.
in S. I. Vavilov

KARYAKIN, A.V.

USSR/Physical Chemistry - Radiation Chemistry, Photochemistry,
Theory of Photographic Process.

B-10

Abs Jour: Referat. Zhurnal Khimii, No 2, 1958, 3912.

Author : A.V. Karyakin, A.V. Shabliya.
Inst : Academy of Sciences of USSR.
Title : Study of Organic Compound Photo-Oxidation Sensitizing by Anthraquinone Derivatives Using Infrared Absorption Spectra.

Orig Pub: Dokl. AN SSSR, 1957, 112, No 4, 688-691.

Abstract: The oxidation of benzaldehyde, tetralin and isopropylbenzene was carried out with uninterrupted bubbling with O₂ and irradiation by Hg-tubes SVDSh-250 and SVDSh-500 with light filters. Anthraquinone (I), β -oxyanthraquinone (II), β -aminoanthraquinone (III), anthraquinone (IV), α -chloranthraquinone (V), α -oxyanthraquinone (VI), α -aminoanthraquinone (VII) and 1,4-dioxyanthraquinone (VIII) served as sensitizers. The reaction was followed by the appearance of OH

...KARYAKIN, A. V.

20-6-21/42

AUTHORS: Karyakin, A. V. , and Shablya, A. V.

TITLE: Structure of 9-Aminoacridine According to Spectrum Data (Stroyeniye 9-aminoakridina po spektral'nyy dannyy)

PERIODICAL: Doklady AN SSSR, 1957, Vol. 116, Nr 6, pp. 969 - 972 (USSR)

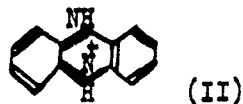
ABSTRACT: In a previous work of the first author (ref. 1) the supposition has been expressed that the substance mentioned in the title has an acridone-imine structure. Other works, later ones, (ref. 2, 3) however, maintain its amine-structure. In the work given here the infrared absorption spectra of the aminoacridine and the acridine derivatives within the range of the base- and deformation frequencies of the NH group should be studied. There, solutions in CCl₄ and a prism of LiF for the range of the base frequencies have been used, for the deformation frequencies of the NH group, however, a prism of NaCl. There, 5 - 20 μ thick layers of the substances sublimated at -180° in the vacuum have been investigated; or compressed targets of KJ mixed with the investigated substance in the vacuum. By means of these methods the absorption bands of the solvent which are very intensive in this spectrum range are removed entirely. The absorption spectra of the mentioned substances are included

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20-6-21/42

Structure of 9-Aminoacridine According to Spectrum Data

in figure 1, the frequencies in table 1. Herefrom it is to be seen that 1- and 2-aminoacridine have two narrow absorption bands with a frequency of 3410 and 3485 cm^{-1} . These are generally classed with the symmetrical and the antisymmetrical oscillations of the NH_2 group. The values of the frequencies agree well with those of the 9-aminoanthracene. From the carrying out of a comparison the authors draw the conclusion that the frequency 3440 cm^{-1} in the 9-aminoacridine also shall be put to the oscillation frequency of the group $>\text{NH}$ group, i.e. they assume an acridone-amine-tautomerism I. Although this frequency still thereto corresponds to a frequency in the acridine ion, it is due to the oscillations of the group $>\text{NH}^+$ for the case that the nitrogen of the heterocycle is tetravalent and positively charged. If an inside ionized structure of the 9-aminoacridine is assumed as (II)



then the frequency decrease of the fluctuations of the group NH , compared to secondary amines as well as pyrrol and indol, may be defined as consequence of the presence of a positively charged ni-

KARYAKIN, A.V., Doc Chem ~ci -- (diss) "Spectral study of the reaction of photooxidation of organic compounds and the role of metastable states." Mos 1958, 16 pp (Mos State Univ im M.V. Lomonosov) 150 copies. List of author's works at end of text (28 titles) (KL, 42-58, 113)

- 4 -

AUTHORS: Shablya, A.V. and Karyakin, A.V.

SOV/51-5-1-6/19

TITLE: Spectra of Chlorophyll and its Analogues in the Adsorbed State
(Spektry khlorofilla i yego analogov v adsorbirovannom sostoyanii)

PERIODICAL: Optika i Spektroskopiya, 1958, Vol 5, Nr 1, pp 44-50 (USSR)

ABSTRACT: The authors investigated the effect of molecular oxygen, water vapour, ethyl alcohol, benzene and other substances on fluorescence of chlorophyll a + b, pheophytin a + b and of phthalocyanins of magnesium, zinc and without metal, adsorbed on magnesium oxide, silica gel and aluminium oxide under the conditions identical with those described in Ref 1. The fluorescence spectra of the adsorbed dyes were recorded using an ISP-17 mirror monochromator with a glass prism. Photomultipliers were used as receivers and the fluorescence was excited with a group of lines near 365 mμ from a mercury-quartz lamp SVDSH-250-3. The diffuse reflection spectra were measured using a recording spectrophotometer SF-1M. The positions of the absorption and fluorescence maxima of the studied dyes are given in the table on p 46. Figs 1 and 2 give the changes of the fluorescence and absorption spectra of Mg phthalocyanin after heating under vacuum at various temperatures. Fig 3 shows quenching of Mg phthalocyanin fluorescence by oxygen. Fig 4 shows the effect of water vapour on the

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SOV/51-5-1-5/19

Spectra of Chlorophyll and its Analogues in the Adsorbed State

fluorescence spectrum of chlorophyll a + b. Figs 5 and 6 show the effects of water vapour and ethyl alcohol on the fluorescence spectra of chlorophyll a + b and Mg phthalocyanin respectively. The fluorescence and absorption spectra of the dyes studied in the adsorbed state were displaced with respect to the same spectra where these dyes were in solution. Adsorption of water vapour, ethanol, ether and other substances produces changes in the fluorescence spectra of adsorbed dyes in such a way as to make these spectra resemble more closely those obtained in solution. Oxygen produces uniform quenching of the fluorescence spectra. The results do not confirm Gachkovskiy's suggestion (Refs 1, 2) that the absorption and fluorescence spectra of chlorophyll and phthalocyanin are due exclusively to attachment of an oxygen-containing molecule to the central Mg atom, since in similar molecules which do not contain Mg the absorption and fluorescence spectra are also observed. The authors thank A.N. Terenin for suggestion of this work and his advice. There are 6 figures, 1 table and 10 references, 8 of which are Soviet, 1 American and 1 German.

Card 2/2

ASSOCIATION: Gosudarstvennyy opticheskiy institut im. S.I. Vavilova (State Optical Institute imeni S.I. Vavilov) 1. Chlorophylls-Fluorescence 2. Chlorophylls-Spectra 3. Magnesium phthalocyanin-Fluorescence 4. Magnesium phthalocyanin-Spectra

SUBMITTED: January 21, 1958

SOV/51-5-6-4/19

AUTHORS: Karyakin, A.V. and Shabliya, A.V.

TITLE: Oxygen Quenching of Fluorescence of Adsorbed Chlorophyll and its Analogues (Tusheniye kislorodom fluorestsentsii khlorofilla i yego analogov v adsorbirovannom sostoyanii.)

PERIODICAL: Optika i Spektroskopiya, 1958, Vol 5, Nr 6, pp655-662 (USSR)

ABSTRACT: The authors studied oxygen quenching of fluorescence of chlorophyll a+b, pheophytin a+b, zinc, magnesium and metal-less phthalocyanin, adsorbed on silica gel. The effect of water and ethanol molecules on the fluorescence spectra was also studied. Phthalocyanins were adsorbed as vapours under conditions of high vacuum. Chlorophyll and pheophytin were adsorbed from alcohol solutions and the samples were then outgassed under high vacuum at room temperature. Fluorescence of adsorbates was excited with the 366 mμ line from a mercury lamp SVDSH-250 with two filters UFS-4 and SZS-10. A glass mirror monochromator ISP-17 (GOI system) with a mechanical scan of light was used. A photomultiplier FEU-22 connected to a self-recording electronic potentiometer EPPV-51 was used to measure the intensities. Table 1 gives the positions of the absorption and fluorescence maxima of the five substances studied. Figs 1 and 2 show the effect of water and ethanol vapours (Fig 1) and of oxygen (Fig 2) on the fluorescence

Card 1/3

SOV/51-5-6-4/19
Oxygen Quenching of Fluorescence of Adsorbed Chlorophyll and its Analogues

spectra of chlorophyll a+b (Figs 1a, 2a) and of Mg phthalocyanin (Figs 1b, 2b). Fig 3 shows the quenching effect of oxygen on the fluorescence of the five substances studied as a function of oxygen pressure in mm Hg (abscissa). The quenching effect (ordinate) is given in the form of two ratios J_0/J_p and J_p/J_0 , where J_0 is the initial fluorescence intensity and J_p is the intensity at a given pressure of oxygen. Table 2 gives the mean values of the excited-state lifetimes of chlorophyll and its analogues, calculated from the slopes of the straight lines $J_0/J_p = f(p)$ in Fig 3. These calculated values are repeated in Table 3 (col. 2) and are compared with the excited state lifetimes measured with a fluorimeter (col. 3). The authors make the following conclusions. (1) The fluorescence spectra of the five substances studied, adsorbed on silica gel, are dispersed and broadened compared with the fluorescence spectra of the same substances in ethanol, acetone, ether and other solutions. (2) Oxygen is found to quench the fluorescence of adsorbates. (3) Vapours of water, ethanol, ether, etc., were found to alter the fluorescence spectra of adsorbates in such a way as to make them similar to the spectra of solutions.

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SOV/51-5-6-4/19

Oxygen Quenching of Fluorescence of Adsorbed Chlorophyll and its Analogues

(4) The anomalous effects reported by Gachkovskiy (Ref 4) for the five substances discussed here when adsorbed on MgO were not observed when silica gel was used. The authors thank A.N. Terenin who directed this work. There are 3 figures, 3 tables and 22 references, 12 of which are Soviet, 5 American, 4 mixed and 1 Dutch.

SUBMITTED: January 21, 1958.

Card: 3/3

AUTHORS: Nikitin, V. A., Karyakin, A.V. SV 76-32-6-43/46

TITLE: The Sensitization of the Photooxidation of Benzaldehydes
by Acridine Derivatives (Sensibilizatsiya fotookisleniya
benzal'degida proizvodnymi akridina)

PERIODICAL: Zhurnal fizicheskoy khimii, 1958, Vol. 32, Nr 6,
pp. 1431-1432 (USSR)

ABSTRACT: In the elaboration of an earlier paper experiments were
carried out at -50°C with solutions of benzaldehyde on
acetone in the visible light with the addition of acridine-
or anthraquinone derivatives (or without them) at the
passage of dry oxygen and at a simultaneous illumination
for 7 hours. The absorption of the solutions was measured
prior to and after the experiment by means of an infrared
spectrometer IKS-11 within the range of $650-900\text{ cm}^{-1}$. The
used sensitizers as well as the results obtained are given
in a table from which may be seen that: 1. The elimination
of the fluorescence by oxygen must be considered as a
requirement for the sensitization of the photochemical
oxidation, and 2. In spite of this phenomenon a sensitizing

Card 1/2

The Sensitization of the Photooxidation of Benzaldehydes SOV/76-32-6-43/46
by Acridine Derivatives

effect may not occur, as was found in the case of 9-aminoacridine. The sensitization can also take place when the stored excitation energy of the sensitizer is insufficient to transform the molecules of benzaldehyde into the biradical state; when, however, the stored energy ΔE is sufficient the strongest sensitizing effect can be noticed. However, as was assumed by A.N. Terenin (Ref 5) the photosensitization can take place by a dehydration of benzaldehyde. Finally the authors thank A. N. Terenin Member of the Academy of Sciences. There are 1 table and 5 references, which are Soviet.

SUBMITTED: November 10, 1957

1. Benzaldehydes--Oxidation
2. Acridines--Chemical reactions
3. Sensitization
4. Fluorescence--Chemical effects

Card 2/2

94(4)

PHASE I BOOK EXPLOITATION

SOV/3345

Karyakin, A.V.

Lyuminestsennaya defektoskopiya (Luminescent Defectoscopy) Moscow, Oborongiz, 1959. 49 p. 6,050 copies printed.

Ed.: M.V. Savost'yanovaya, Doctor of Physical and Mathematical Sciences, Professor, and B. Ya. Sveshnikov, Doctor of Physical and Mathematical Sciences; Ed. of Publishing House: A.A. Khrustaleva; Tech. Ed.: V.I. Oreshkina.

PURPOSE: This book is intended for industrial engineers in machine-building and instrument-making industries.

COVERAGE: The booklet gives brief information on luminescence and reviews methods and fields of application of luminescent defectoscopy. There is a detailed description of a method used by the Kirovskiy Plant, State Optical Institute, to determine the position and depth of minute surface defects. No personalities are mentioned. There are 72 references: 28 Soviet, 34 English, 7 German, 2 French, and 1 Italian.

Card 1/3

Luminescent Defectoscopy

80V/3345

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Card 2/3

24(4), 5(3), 24(7)

007/51-7-1-21/27

AUTHOR: ~~Karyakin, A.V.~~

TITLE: On the Chemiluminescence of Lucigenine and its Derivatives (K voprosu o khemilyuminestsentsii lyutsigenina i yego proizvednykh)

PERIODICAL: Optika i spektroskopiya, 1959, Vol 7, Nr 1, pp 122-124 (USSR)

ABSTRACT: The author studied photoluminescence and chemiluminescence of aqueous solutions of lucigenine bromide and pyridine solutions of NN'-dimethylbiacridine oxide (obtained from lucigenine by action of alkalis) and NN'-dimethylbiacridine. The fluorescence and chemiluminescence spectra were obtained using photoelectric apparatus (Ref 8) and the phosphorescence spectra were recorded photographically (Ref 9) or photoelectrically (Ref 10) using a phosphoroscope at liquid-air temperature. The compositions of the solutions were as follows: 0.5% of lucigenine bromide, 2% of alkali and 1% of hydrogen peroxide; 1.2% of NN'-dimethylbiacridine oxide and 1-2% of H₂O₂; 0.2% of NN'-dimethylbiacridine and 1-2% of H₂O₂. The fluorescence and chemiluminescence spectra of the three compounds are shown in a figure on p 123; the main maxima of the fluorescence, chemiluminescence and phosphorescence spectra are collected in a table on p 123. From the published data and the results of his own work, the author concludes that

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On the Chemiluminescence of Lucigenine and its Derivatives

SOV/51-7-1-21/27

hydrogen peroxide, or a product of its electrolytic dissociation, forms a "transanular" peroxide which is responsible for chemiluminescence. The new peroxide decomposes into hydrogen and a biradical under the actions of thermal vibrations. This biradical (with two unpaired electrons, "triplet" state) emits a quantum of light on transition to the ground "singlet" state. Since the chemiluminescence spectra of lucigenine and NH' -dimethylbiacridine oxide are not identical, their chemiluminescent reactions are similar but independent of one another. Acknowledgments are made to B.Ya. Sveshnikov for some of the information used in the paper and to V.L. Yermolayev for carrying out measurements of the phosphorescence spectra. There are 1 figure, 1 table and 11 references, 5 of which are Soviet, 1 English, 1 German, 1 Hungarian and 3 mixed (German, English, Japanese, French, Soviet and Polish).

SUBMITTED: December 29, 1958

Card 2/2

24(7)

AUTHOR:

Karyakin, A. V.

SOV/48-23-1-7/36

TITLE:

Extinction of the Fluorescence of Heated Adsorbates of a Number of Anthraquinone Derivatives by Means of Oxygen (Tusheniye kislородом fluorestsentsii nagretykh adsorbatov ryada proizvodnykh antrakhinona)

PERIODICAL:

~~Investiya~~ Akademii nauk SSSR. Seriya fizicheskaya, 1959, Vol 23, Nr 1, pp 32 - 36 (USSR)

ABSTRACT:

Derivatives of anthraquinone which affiliated the substituents OH, NH₂ in α position to the C=O group, produced an intramolecular hydrogen bond which considerably reduces the energy level of electrons and thereby shifts the fluorescence spectrum toward the long-wave range (larger than 500 m μ), in contrast with the β -derivatives. Already earlier (Ref 1) it has been known that the fluorescence of anthraquinone and its derivatives in vaporous and adsorbed state are extinguished by oxygen in all those substances which possess an energy level of electrons corresponding to a wave length shorter than 500 m μ . However, it was shown

Card 1/2

Extinction of the Fluorescence of Heated Adsorbates
of a Number of Anthraquinone Derivatives by Means of Oxygen

SOV/48-23-1-7/36

that, if these substances are excited by irradiation in the long-wave absorption maximum, no extinction is observed. On the other hand, also long-wave fluorescence bands can be diminished by heating in vacuum, whereby maxima are formed in the blue and ultraviolet range which are extinguished by oxygen. All these phenomena were investigated and studied with 1,4-dioxy-anthraquinone, α -amino and α -oxy-anthraquinone. Excitation in the short-wave range increases the intensity of short-wave maxima, decreases that of long-wave maxima and thus promotes extinction by oxygen. This process is also supported by heating. The α -amino derivatives of anthraquinone which possess only a weak hydrogen bond, are especially subject to this process. For the adsorbate 1,5-dioxy-anthraquinone the extinction coefficient was calculated according to the formula (Ref 6). The result was 1.6 kcal. This lecture is discussed by D. N. Shigorin and the author. There are 3 figures and 6 references, 4 of which are Soviet.

Card 2/2

KARYAKIN, A.V.; ANISIMOVA, I.N.; KUDERSKAYA, M.K.

Photography of luminescent medical objects on colored photographic materials. Grud. khir. 2 no.6:110-112 N-D '60. (MIRA 14:1)

1. Iz laboratorii patomorfologii (zav. - prof. Ya.I. Rapoport)
Instituta grudnoy khirurgii (dir. prof. S.A. Kolesnikov) AMN SSSR.
Adres avtorov: Moskva, Leninskiy prospekt, d. 8, Institut grudnoy
khirurgii AMN SSSR.

(PHOTOGRAPHY, MEDICAL)

24,3410

68326

AUTHORS: Kovner, M.A., Karyakin, A.V. and Yefimov, A.P.

SOV/51-8-1-32/40

TITLE: Characteristic Frequencies of the Hydroperoxide Group C--O--O--H

PERIODICAL: Optika i spektroskopiya, 1960, Vol 8, Nr 1, pp 128-130 (USSR)

ABSTRACT: The authors discuss vibrational frequencies of the hydroperoxide group C--O--O--H. Studies of the infrared spectra of hydroperoxides showed that the C--O--O--H vibrations have the following frequencies: 840, 880, 1155, 1325, 3450 cm^{-1} . These frequencies were tentatively assigned to $\delta(\text{COOH})$, $\nu(\text{O--O})$, $\nu(\text{C--O})$, $\delta(\text{O--H})$, $\nu(\text{O--H})$, respectively. The corresponding frequencies of C--O--O--D were found at 800, 855, 995, 1155, 2550 cm^{-1} in the spectrum of isopropylbenzene peroxide (Ref 2). Analysis of the two sets of frequencies shows that they are incomplete. Firstly a non-linear chain consisting of four atoms should have six vibrational frequencies and secondly the reported data suggest that the frequencies of vibrations of the angle XYZ (X, Y and Z are the heavy atoms) lie below 600 cm^{-1} , i.e. in the two sets of values (given above) the frequency $\delta(\text{COO})$ is absent. This was confirmed experimentally by the discovery of a very intense line at 585 cm^{-1} in the spectrum of isopropylbenzene hydroperoxide (cf. curve 1 in a figure on p 128). This line was interpreted as $\delta(\text{COO})$ of the COOH group. The corresponding frequency in the COOD group is unfortunately not known. The 840 cm^{-1}

Card 1/3

68326

Characteristic Frequencies of the Hydroperoxide Group C--O--O--H SOV/51-8-1-32/40

frequency, previously denoted by $\delta(\text{COOH})$ can now be assigned to vibrations of a dihedral angle χ between the plane COO and OOH. Since the geometry of the hydroperoxide group in isopropylbenzene was not known the authors used geometrical parameters of the same group in performic acid: $\text{O--O} = 1.35 \text{ \AA}$, $\text{O--O} = 1.49 \text{ \AA}$, $\text{O--H} = 1.02 \text{ \AA}$, $\angle \text{COO} = 105^\circ$, $\angle \text{OOH} = 100^\circ$ (Ref 3). The dihedral angle χ was taken to be 90° . Assuming the bond lengths and angles just listed and using "spectroscopic masses" of H and D, the authors calculated kinematic coefficients which are given in Table 1 (cols 2 and 4). Six of the eleven non-zero force constants were found by various methods and the remainder were deduced from the constants of CH_3OH (Ref 5) and methyl alcohol; all 21 force constants are given in cols 3 and 6 of Table 1. The calculated and observed vibrational frequencies of COOH and COOD are given below;

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S/051/60/009/005/015/019

E201/E191

AUTHORS: Gribov, L.A., and Karyakin, A.V.

TITLE: The Intensities of Infrared Absorption Bands²¹ of the
Hydroperoxide Group¹

PERIODICAL: Optika i spektroskopiya, 1960, Vol.9, No.5, pp 666-668

TEXT: A study of the infrared spectra of hydroperoxides showed which frequencies represent the COOH group. Recently Kovner et al. (Ref. 1) calculated the vibrational frequencies of a free COOH (COOD) group, assuming that its structure is that shown in a figure on page 666. Kovner et al. found the calculated and empirical values of frequencies to be in good agreement and interpreted some frequencies. The present paper gives a calculation of the vibrational frequencies (Table 1) of COOH (COOD) groups using information supplied by Kovner. The forms of the vibrations (Table 1) and the displacements of atoms during vibrations were also calculated. The results were used to estimate approximately the vibrational band intensities (Table 2) using a general method proposed by Gribov (Refs 3, 4).

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E201/E191

The Intensities of Infrared Absorption Bands of the Hydroperoxide Group

The 1322 cm^{-1} vibration of the angle OOH and the 3450 cm^{-1} valence vibration of the OH bond were the most reliable characteristics of COOH groups.

Acknowledgement is made to M.A. Kovner for supply of necessary information.

There are 1 figure, 2 tables and 5 references: 4 Soviet and 1 English.

SUBMITTED: April 7, 1960

Card 2/2

5.4500

68345

5(4)

AUTHOR:

Karyakin, A. V. (Moscow)

S/076/60/034/01/023/044
B010/B014

TITLE:

Sensitization of Oxidation and Extinction of Fluorescence of Organic Substances by Oxygen

PERIODICAL:

Zhurnal fizicheskoy khimii, 1960, Vol 34, Nr 1, pp 144-149 (USSR)

ABSTRACT:

In this paper the author investigated the oxidation of benzaldehyde, ¹tetralin, and isopropyl benzene, which had been photosensitized by derivatives of anthraquinone and acridine. Experimental data are compiled in a table. They disclose a distinctly marked relation between the sensitizing effect of the afore-mentioned derivatives and the strong extinction of their fluorescence by molecular oxygen, as well as the existence of a retarded fluorescence of the adsorbed substances, i.e., of a triplet level. The following mechanism of oxidation sensitization was assumed: When a photon is absorbed, the sensitizer first passes over into an excited state and then into a metastable (triplet) state due to the action of a paramagnetic O₂ molecule. The biradical, i.e., the triplet-state molecule is

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Sensitization of Oxidation and Extinction of
Fluorescence of Organic Substances by Oxygen

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S/076/60/034/01/023/044
B010/B014

able to add the oxygen under the formation of an unstable complex having the properties of a biradical: $\cdot S + O_2 \rightarrow \cdot SO_2 \cdot$. Biradicals $\cdot SO_2 \cdot$ which exhibit an increased chemical activity

are responsible for the sensitization of the photooxidation of organic compounds (Ref 5). In this connection the following initial stages of the oxidative chain reaction are possible: The excitation energy is imparted from the biradical $\cdot SO_2 \cdot$ to

the oxidizable molecule so that the latter becomes biradical. It is, however, more likely that the oxidizable molecule is dehydrated by the biradical $\cdot SO_2 \cdot$ under the formation of a corresponding radical. A scheme² (p 147) is suggested for the interaction between the photosensitized molecule, oxygen and other molecules. Frequency extinction, direct and sensitized oxidation take place via an intermediate compound which constitutes an unstable oxygen complex with an excited triplet-state molecule of the substance. Consequently, the metastable (triplet) state of the molecule determines not only the extinction of fluorescence but also the direct and sensitized oxida-

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Sensitization of Oxidation and Extinction of
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tion. The author thanks Academician A. N. Terenin for his supervision. Ye. V. Grushkun and E. S. Borodin are also mentioned in this paper. There are 1 table and 11 references, 9 of which are Soviet. ✓

SUBMITTED: April 22, 1958

Card 3/3

KARYAKIN, A. V., KUTYURIN, V. M., CHIBISOV, A. K., and ULUBEKOVA, M. V.
(USSR)

"Spectroscopic Study of Chlorophyll and its Dervatives in vitro."

Report presented at the 5th International Biochemistry Congress,
Moscow, 10-16 Aug 1961

KARYAKINA, T. I., FRENKEL, S. YA., KARYAKIN, A. V. (USSR)

"On the Mechanism of the Reversible Association and
Dissociation of Glycine."

Report presented at the 5th International Biochemistry Congress,
Moscow, 10-16 August 1961

KARYAKIN, A.V.; TOKAREVA, V.Ya.; SKVORTSOVA, N.I.

Quantitative determination of α - and β - ionones in their
mixtures. Trudy VNIISNDV no.5:72-75 '61. (MIRA 14:10)
(Ionone)

KRETOVICH, V.L.; SMIRNOVA, T.I.; KARYAKIN, A.V.

Mechanism of the reversible association of glycinin in solutions in connection with changes in pH. Vysokom.soed. 3 no.9:1389-1394 S '61. (MIRA 14:9)

1. Institut biokhimii imeni A.N. Bakha AN SSSR i Institut geokhimii i analiticheskoy khimii AN SSSR.
(Glycinin--Spectra) (Hydrogen-ion concentration)

KARYAKIN, A.V.; GLADKOVA, M.A.; MILAYEVA, M.A.

Comparative investigation of the absorption and fluorescence spectra of blood serum from patients with cancer of the lungs and normal persons. Biofizika 6 no. 2:240-242 '61. (MIRA 14:4)

1. Institut grudnoy khirurgii Akademii meditsinskikh nauk SSSR, Moskva.

(SERUM—SPECTRA) (CANCER)

GLADKOVA, M.A.; BYKOVA, N.A.; MILAYEVA, M.A.; KARYAKIN, A.V.

Luminescence study of transplanted Brown-Pearce tumors in rabbits. Vop.onk. 7 no.5:41-46 '61. (MIRA 15:1)

1. Iz legochnogo otdeleniya (zav. - prof. N.I. Gerasimenko) i patomorfologicheskoy laboratorii (zav. - prof. Ya.L. Rapoport) Instituta grudnoy khirurgii AMN SSSR (dir. - prof. S.A. Kolesnikov, nauchnyy rukovoditel' - akad. A.N. Bakulev). (SKIN--CANCER)

KRETOVICH, V.L.; SMIRNOVA, T.I.; KARYAKIN, A.V.

Study of the absorption spectra of glycinin in connection with its association-dissociation. Biokhimiia 26 no.5:800-806 S-0 '61.

(MIRA 14:12)

1. Institute of Biochemistry, and Institute of Geochemistry and Analytical Chemistry, Academy of Sciences of the U.S.S.R., Moscow.
(GLYCININ)

KARYAKIN, A.V.

Spectral determination of peroxide compounds in photochemical
oxidation. Usp.khim. 30 no.8:1050-1068 Ag '61. (MIRA 14:9)
(Peroxide--Spectra)

KARYAKIN, A.V.; KUTYURIN, V.M.; CHIBISOV, A.K.

The state of the water in chlorophyll molecule. Dokl. AN SSSR
140 no.6:1321-1323 0 '61. (MIRA 14:11)

1. Institut geokhimii i analiticheskoy khimii im. V.I.Vernadskogo
AN SSSR. Predstavleno akademikom A.P.Vinogradovym.
(Water) (Chlorophyll--Spectra)

5.5456

27.1110

S/020/61/141/003/020/021
B103/B101

AUTHORS: Kutyurin, V. M., Karyakin, A. V., Chibisov, A. K., and Artamkina, I. Yu.

TITLE: Isotopic exchange of hydrogen atoms in chlorophyll

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 141, no. 3, 1961, 744 - 747

TEXT: Degree and rate of deuterium exchange of chlorophylls a and b with D_2O were studied (1) on the basis of infrared spectra, (2) on the basis of the exchange between chlorophyll and T_2O . The authors used chlorophyll preparations (a and b) obtained from small nettle (*Urtica urens*) by methods described earlier (V. M. Kutyurin et al., Fiziol. rast., 8, no. 4 (1961)). Solid pigment films were produced on a fluorite plate by evaporation of ethereal solutions. The spectra of such films were recorded by a UR - 10 split-beam infrared spectrophotometer. The films were exposed to D_2O or H_2O vapors in vacuum vessels with fluorite windows (at $3 - 5 \cdot 10^{-6}$ mm Hg). So far, it has been difficult to study the hydrogen exchange of chlorophylls due to a lack of reliable purity criteria of chlorophyll preparations and

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B103/B101

Isotopic exchange of hydrogen ...

their hygroscopicity. The authors eliminated these difficulties (V. M. Kut'yurin, Fiziol. rast., 7, no. 2, 133 (1960); A. V. Karyakin et al., DAN, 140, no. 6 (1961)). In the spectra of solid films of chlorophylls a and b, a wide, asymmetric, intensive band ($3600 - 3200 \text{ cm}^{-1}$) occurs which belongs to the $\nu(\text{O-H})$ of water molecules bound to the pigments. The intensity of this band in chlorophyll a was reduced by exposure to D_2O vapor for 5 min. 4

In addition, an absorption band occurred in the region $2600 - 2400 \text{ cm}^{-1}$, which characterizes $\nu(\text{O-D})$ of the exchanged D_2O molecules. This process was continued and intensified by repeated pigment treatment with D_2O vapor at room temperature until, after 15 hr, a complete deuterium exchange of H_2O bound by the pigment was reached. On the basis of these results and repeated treatment in vacuo at $58 - 60^\circ\text{C}$ and in D_2O and H_2O vapors, the following was concluded: The bonds between adsorbed water (H_2O and D_2O) and pigments a and b, respectively, are not equally firm. The rates of isotopic exchange of the two types of water also differ. A striking connection exists between the unstable bond of water in chlorophyll a on the one hand, and an intense isotopic exchange in this chlorophyll as compared 2/4

Isotopic exchange of hydrogen ...

S/020/61/141/003/020/021
B103/B101

pared to chlorophyll b, on the other hand. In molecules of chlorophyll a, the isotopic exchange of enol (O-H or O-D) is much more difficult than it is in the case of unstably bound water. Interaction of water and pigment probably takes place at the O atoms of the cyclopentane ring. The probability of an isotopic exchange of the C-H bond, which is only a few percents, cannot be checked due to insufficient precision of the spectrum method. Therefore, T₂O was used for the chlorophyll exchange in acetone, alcohol, and pyridine in light (50,000 lux), and in the dark. T₂O allows an estimation of the exchange within 0.1%. The pigment solution and water were degassed in a special permanently air-tight vessel in vacuo ($p \leq 10^{-2}$ mm Hg) to prevent photooxidation of the pigment. 20% by volume of water containing T₂O was added to chlorophyll. Desiccated pigment was burned in dry O₂, the resulting water was completely decomposed with calcium carbide, and the radioactivity of acetylene thus formed was measured with an $\text{CS} - 7(\text{Sb} - 7)$ counter. Light was found to stimulate the isotopic exchange but little. Disagreement with results obtained in previous studies (V. M. Kuturina, Fiziol. rast., 7, no. 2, 133 (1960); Ref. 4, see below) is probably due to the action of humidity and, above all, to the label loss. So far, it

Card 3/4

YEFUNI, Yu. N.; KARYAKIN, A. V.; SOROKIN, N. P.; DOLGINOV, I. Ye.

Portable luminescent illuminator. Vest. otorin. no.2:89-90 '62.
(MIRA 15:2)

1. Iz Nauchno-issledovatel'skogo instituta ukha, gorla i nosa
Ministerstva zdavookhraneniya RSFSR (dir. - prof. N. A.
Bobrovskiy) i ordena Lenina klinicheskoy bol'nitsy imeni S. P.
Botkina, Moskva.

(OTORHINOLARYNGOLOGY--EQUIPMENT AND SUPPLIES)
(ULTRAVIOLET RAYS)

S/192/62/003/006/003/004
D228/D307

AUTHORS: Karyakin, A.V. and Volynets, M.P.
TITLE: Infrared spectra of the carbonate complex of thorium
PERIODICAL: Zhurnal strukturnoy khimii, v. 3, no. 6, 1962, 714-716

TEXT: The aim of the research was to demonstrate the participation of CO_3^{2-} ions in the coordination bond of $\text{Na}_4[\text{Th}(\text{CO}_3)_4]$. $\text{Na}_2\text{CO}_3 \cdot 12\text{H}_2\text{O}$ and the presence of free CO_3^{2-} in the outer sphere of this complex. Measurements were made on a UR-10 spectrophotometer on wavelengths of 400 to 4000 cm^{-1} . Data for the hydrated complex show that the frequencies of CO_3^{2-} absorption bands coincide quite well with those for the complex $[\text{Co}(\text{NH}_4)_4\text{CO}_3]$. Besides absorption bands, relating to CO_3^{2-} ions in the inner sphere of the complex, there are others with frequencies of 870 and 1070 cm^{-1} , possibly relating to the absorption of hydrated CO_3^{2-} present in the outer sphere. This is confirmed by appearance of certain absorption bands

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Infrared spectra ...

S/192/62/003/006/003/004
D228/D307

in the infrared spectrum of the dehydrated complex. These bands have frequencies of 700-705 and 855 cm^{-1} and are characteristic and anhydrous Na_2CO_3 . There are 2 tables and 1 figure.

ASSOCIATION: Institut geokhimii i analiticheskoy khimii im. V.I. Vernadskogo (Institute of Geochemistry and Analytical Chemistry im. V.I. Vernadskiy)

SUBMITTED: July 20, 1962

Card 2/2

KARYAKIN, A.V.; ANISIMOVA, I.N.

Fluorescence of the pulmonary tissue under normal conditions
and in lung cancer. Biofizika 7 no.2:145-149'62. (MIRA 16:8)

1. Institut geokhimii i analiticheskoy khimii imeni Vernadskogo
AN SSSR, Moskva, i Institut grudnoy khirurgii AMN SSSR, Moskva.
(FLUORESCENCE) (LUNGS—CANCER)

KARYAKIN, A.V.

Mechanism of helium separation from metamict zircons.
Geokhimiia no.8:660-664, '62. (MIRA 15:9)

1. Vernadskiy Institute of Geochemistry and Analytical
Chemistry, Academy of Sciences, U.S.S.R., Moscow.
(Helium) (Zircon)

YEFUNI, Yu.N.; KARYAKIN, A.V.

Spectrum study of the luminescence of the tissues of
otorhinolaryngological organs. Biofizika 7 no.4:480-483 '62.
(MIRA 15:11)

1. Gosudarstvennyy nauchno-issledovatel'skiy institut ukha, gorla
i nosa Ministerstva zdavookhraneniya RSFSR i Moskovskaya ordena
Lenina klinicheskaya bol'nitsa imeni S.P.Botkina.
(FLUORESCENCE) (OTORHINOLARYNGOLOGY)

KARYAKIN, A.V.; CHIBISOV, A.K.

APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000720920016-4

Spectral study of the state of water in chlorophyll. Biofizika 7
no.5:561-567 '62. (MIRA 17:8)

1. Institut geokhimii i analiticheskoy khimii imeni V.I.
Vernadskogo AN SSSR, Moskva.

ZOLOTOV, Yu.A.; SERYAKOVA, I.V.; ANTIPOVA-KARATAYEVA, I.I.; KUTSENKO,
Yu.I.; KARYAKIN, A.V.

Effect of the organic solvent on the formation of the tetrachloro-
ferrate ion during extraction of iron from chloride solutions.
Zhur.neorg.khim. 7 no.5:1197-1203 My '62. (MIRA 15:7)
(Iron) (Chlorides) (Extraction (Chemistry))

KARYAKIN, A.V.; CHIBISOV, A.K.

Study of the keto-enol tautomerism of chlorophyll based on
infrared absorption spectra. Opt. i spektr. 13 no.3:379-382
S '62. (MIRA 15:9)
(Keto-enol substances) (Chlorophyll--Spectra)

KARYAKIN, A.V.

"Methods of infrared spectroscopy in chemical analysis" by I. Kössler.
Reviewed by A.V. Kariakin. Zhur. anal. khim. 17 no. 8:1031 N '62.

(MIRA 15:12)

(Spectrum, Infrared)

(Chemistry, Analytical)

KARYAKIN, A.V.

Spectral study of the luminescence of malignant tumors.
Izv. AN SSSR. Ser. fiz. 26 no.1:94-99 Ja '62. (MIRA 15:2)
(CANCER)
(SPECTRUM ANALYSIS)
(LUMINESCENCE)

KARYAKIN, A.V.; DUZHENKOV, V.I.

Impulse spectroscopy, a method for the investigation of rapid
photochemical reactions. Usp.khim. 31 no.12:1511-1527 D '62.
(MIRA 16:2)

1. Institut geokhimi i analiticheskoy khimii AN SSSR imeni
V.I.Vernadskogo.

(Photochemistry) (Spectrum analysis)

SERYAKOVA, I.V.; ZOLOTOV, Yu.A.; KARYAKIN, A.V.; GRIBOV, L.A.;
ZUBRILINA, M.Ye.

Possibility of the solvation of a tetrachloroferrate ion in
the extraction of iron from chloride solutions. Zhur. neorg.
khim. 7 no.8:2013-2018 Ag '62. (MIRA 16:6)

1. Institut geokhimii i analiticheskoy khimii imeni V.I.
Vernadskogo AN SSSR.
(Ferrates) (Solvation) (Chlorides)

L1551

S/076/62/036/010/005/005
B101/B186

5.4500

AUTHORS: Karyakin, A. V. and Terenin, A. N.

TITLE: Photosensitization of the fading of adsorbed methylene blue

PERIODICAL: Zhurnal fizicheskoy khimii, v. 36; no. 10, 1962, 2286-2287

TEXT: The reduction of methylene blue by photosensitization with tryptaflavine was studied. Both dyestuffs were adsorbed from aqueous solutions (10^{-4} - 10^{-5} M) on microporous glass and then exposed to the light of a 100 w lamp with a GG-13 + BG-25 Schott filter combination (370 - 500 mμ). Methods see A. V. Karyakin, Zh. fiz. khimii, 30, 986, 1956. Results: When the adsorbate consisting of tryptaflavine and methylene blue was exposed to light in a vacuum, methylene blue faded much more intensively than in the control experiment without tryptaflavine. Access of oxygen after 20 hrs regenerated the dyestuff in the same manner as in the control experiment. Tryptaflavine alone hardly faded under the same conditions and was not regenerated by O_2 . A shift of the absorption maximum of methylene blue from 680 mμ for the initial substance to 610mμ

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Photosensitization of the fading of ...

S/076/62/036/010/005/005
B101/B186

for the regenerated dyestuff suggests the formation of the leucocompound of methylene blue on fading, the loss of one hydrogen atom, and demethylation into azur I and further on into thionine. This process is aided by the silanol group of the microporous glass. An inductive transfer of excitation energy from the photosensitizer trypanflavine to methylene blue is assumed as the exposure to light does not take place in the absorption maximum of methylene blue. Further experiments should explain the mechanism of similar photosensitization processes. There is 1 figure.. ✓

SUBMITTED: March 22, 1962

Card 2/2

S/020/62/144/003/024/030
B124/B101

AUTHORS: Ryabchikov, D. I., Gerlit, Yu. B., Karyakin, A. V.,
Zarinskiy, V. A., and Zubrilina, M. Ye.

TITLE: Extraction recovery of perrhenates with ketones

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 144, no. 3, 1962, 585-587

TEXT: Data on the influence exerted by the properties of the ketone on the distribution coefficient α in the extraction of perrhenates are presented, and the mechanism of extraction recovery of perrhenates is studied by means of some thermodynamic parameters and the infrared spectra. The relation between the ratio 28 : MW (28 being the molecular weight of the CO group and MW the molecular weight of the ketone) of the extraction solvent and the distribution coefficient was found to be linear for the methyl ketone series, while, with ketones of the same molecular weight and structures different from those of the methyl ketones, deviations from linearity were established. A constant value of ΔH of 9.2 ± 0.3 kcal was established for the methyl ketones. The value for other types of ketones is somewhat lower. Generally, lower values of the "thermodynamic" distribution coefficient α'

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B124/B101

Extraction recovery of ...

and ΔH as well as a shift of the stretching vibration frequency of the C=O group were found in the presence of sodium perrhenate. Since obviously no fundamental difference is to be expected in one series of solvents concerning the mechanism of extraction recovery of sodium perrhenate, the respective deviations are probably due to the difference in the composition of the solvates formed. The infrared spectrum of water in several solvated associates of the perrhenate ion with hydrogen, sodium, potassium, calcium, and aluminum ions remained practically unchanged. When the solvating cations are replaced by a hydrophilic group such as $(C_6H_5)_4As^+$ or $(C_6H_5NH)_3C^+$, some changes of the intensity distribution in the spectrum of water are observed, with the main portion of water remaining more firmly bound than in the ketone-water system. Thus, it can be concluded that the perrhenate ion is hydrated, which agrees with data in literature. The shift of the absorption band frequency of the OH group is somewhat greater in the presence of salts than in the presence of water. It can be stated that there is a direct bond between the ketone and the rhenium ion in the solvate. There are 3 figures and 1 table. The most important English-language reference is: R. D. Waldron, J. Chem. Phys., 26, 809 (1960).

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Extraction recovery of ...

S/020/62/144/003/024/030
B124/B101

ASSOCIATION: Institut geokhimii i analiticheskoy khimii im. V. I.
Vernadskogo Akademii nauk SSSR (Institute of Geochemistry
and Analytical Chemistry imeni V. I. Vernadskiy of the
Academy of Sciences USSR)

PRESENTED: November 13, 1961, by A. P. Vinogradov, Academician

SUBMITTED: November 4, 1961

Card 3/3

ZOLOTOV, Yu.A.; SERYAKOVA, I.V.; KARYAKIN, A.V.; GRIBOV, L.A.;
ZUBRILINA, M.Ye.

Hydrate-solvate mechanism of extraction. Dokl.AN SSSR 145
no.1:100-103 J1 '62. (MIRA 15:7)

1. Institut geokhimii i analiticheskoy khimii imeni V.I.Vernadskogo
AN SSSR. Predstavleno akademikom A.P.Vinogradovym.
(Extraction (Chemistry))

KARYAKIN, A.V.; BEREZOV, Yu.Ye.; ANISIMOVA, I.N.

Fluorescence of esophageal and stomach tissues under the
action of ultraviolet light. Biofizika 8 no.1:129-130 '63.
(MIRA 17:8)

SERYAKOVA, I.V.; ZOLOTOV, Yu.A.; KARYAKIN, A.V.; GRIBOV, L.A.

Hydration and solvation of strong acids during their extraction.
Zhur.neorg.khim. 8 no.2:474-480 F '63. (MIRA 16:5)

1. Institut reokhimii i analiticheskoy khimii imeni V.I.Vernadskogo
AN SSSR.
(Acids--Spectra) (Extraction (Chemistry)) (Solvation)

KARYAKIN, A.V.; CHIBISOV, A.K.

Studies on water condition in chlorophyll a and b and in pheophytin
a and b according to infrared absorption spectra. Biofizika 8 no.4.
441-445 '63. (MIRA 17:10)

1. Institut geokhimii i analiticheskoy khimii imeni Vernadskogo,
Moskva.

ZOLOTOV, Yu.A.; SERYAKOVA, I.V.; KARYAKIN, A.V.; GRIPOV, L.A.; ZUBRILINA, M.Ye.

Infrared spectra of some strong acids extracted with oxygen-containing solvents. Zhur.neorg.khim. 8 no.2:481-486 F '63. (MIRA 16:5)

1. Institut geokhimii i analiticheskoy khimii imeni V.I.Vernadskogo AN SSSR.

(Acids--Absorption spectra) (Solvents)

CHIBISOV, A.K.; KARYAKIN, A.V.

Use of the pulse photolysis method in studying the metastable state
of pigments. Opt. i spektr. 15 no.5:636-644 N '63. (MIRA 16:12)

KARYAKIN, A.V.; PETROV, A.V.

Determination of large concentrations of water in organic solvents
by the absorption spectra in the near infrared region. Zhur.
anal. khim. 18 no.11:1317-1321 N '63. (MIRA 17:1)

1. Institut geokhimi i analiticheskoy khimii imeni V.I. Vernadskogo
AN SSSR, Moskva.

KARYAKIN, A.V.; CHMUTINA, L.A.

Luminescence of glycinin. Izv. AN SSSR. Ser. fiz. 27 no.6:791-795
Je '63. (MIRA 16:7)

1. Institut geokhimii i analiticheskoy khimii im. V.I.Vernadskogo
AN SSSR i Volgogradskiy mekhanicheskiy institut.
(Glycinin--Spectra)

AKHMANOVA, M.V.; KARYAKIN, A.V.; YUKHNEVICH, G.V.

Determination of hydroxyl groups in silicate minerals using
the infrared spectra method. Geokhimiia no.6:581-585 Je '63.
(MIRA 16:8)

1. Vernadsky Institute of Geochemistry and Analytical
Chemistry, Academy of Sciences, U.S.S.R., Moscow.

CHIBISOV, A.K.; KARYAKIN, A.V.

Temperature dependence of the deactivation of the metastable
state of chlorophyll. Dokl. AN SSSR 153 no.5:1132-1135 D '63.
(MIRA 17:1)

1. Institut geokhimii i analiticheskoy khimii im. V.I.
Vernadskogo. Predstavleno akademikom A.P. Vinogradovym.

L 23881-65 EWT(m)/EPF(n)-2/EPR/EWP(t)/EWP(h) Ps-4/Pu-4 IJP(c) JD/

ACCESSION NR: AT5002759 JG/MLK S/0000/64/000/000/0066/0070

AUTHOR: Bibikova, V.I. (Doctor of technical sciences); Marunova, K.V.;
Karyakin, A.V.; Petrov, A.V. 2

TITLE: Extraction method of obtaining pure ammonium perrhenate B+1

SOURCE: Vsesoyuznoye soveshchaniye po probleme reniya. 2d. Moscow, 1962. Renu
(Rhenium); trudy soveshchaniya. Moscow, Izd-vo Nauka, 1964, 66-70

TOPIC TAGS: rhenium, rhenium extraction, ammonium perrhenate, tributyl phosphate,
potassium perrhenate, rhenium refining 4

ABSTRACT: The authors studied an extraction method for obtaining ammonium perrhenate from potassium perrhenate, which was found to be extracted best by tributyl phosphate from weakly acidic media (0.3 N HCl). The optimum conditions for this extraction were established, and a flow diagram of the process based on this extraction and resulting in ammonium perrhenate as the end product is given. The ammonium perrhenate obtained is sufficiently free of impurities to be used for the preparation of pure rhenium metal. The effectiveness of the purification of rhenium during extraction and reextraction was checked by using radioactive isotopes (K^{42} , Ni^{59} , 63 , Sn^{113} , 123 , Ca^{45} , S^{35} , Mo^{99}).

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L 23881-65

ACCESSION NR: AT5002759

Fe⁵⁵, 59, and Cu⁶⁴). From the results obtained, the coefficients of purification, distribution, and separation were calculated. Infrared spectra of tributyl phosphate saturated with 0.3 N HCl and of tributyl phosphate rhenium extracts were found to be similar and led the authors to the conclusion that the extraction of rhenium proceeds via a hydration - solvation mechanism with the formation of the hydroxyl ion, 17e⁻, with the participation of water. Orig. art. has: 4 figures and 2 tables.

ASSOCIATION: none

SUBMITTED: 05Aug64

ENGL: 00

SUB CODE: MM

NO REF SOV: 003

OTHER: 002

Card 2/2

KARYAKIN, A.V.; LAFITSKIY, A.V.; PANKRATOVA, L.M.; PETROV, A.V.

Infrared spectra of zirconium and hafnium compounds with some
complexons in solution. Zhur. strukt. khim. 5 no.5:702-706
5-0 '64 (MIRA 18:1)

1. Institut geokhimii i analiticheskoy khimii AN SSSR i
Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova.

L 17590-65 EWT(m)/EWP(t)/ENP(b) LJP(c)/AS(pp) 2/AFWL/ASD(a)-5/ESD(gs) JD/JG
 ACCESSION NR: AP4049247 S/0074/64/033/011/1337/1348

AUTHOR: Anikina, L. I., Karyakin, A. V.

TITLE: Luminescence of the rare earth elements and its application in analytical chemistry B

SOURCE: Uspekhi khimii, v. 33, no. 11, 1964, 1337-1348

TOPIC TAGS: rare earth, luminescence, phosphor, activated crystallophosphor, rare earth determination, analytical chemistry

ABSTRACT: This is an extensive review of the literature, containing no original work. In the introduction, the authors point out that normal chemical analysis is inadequate for the rare earth elements due to the extreme similarity of their properties. Spectroscopic methods and luminescence analysis are now generally used. Emission spectra cannot be used because of the coincidence of many thousands of lines. The X-ray region of the spectrum, affording a 10-3% accuracy, is more reliable, but a drawback is low sensitivity. Basically, the light absorption and luminescence of the rare earth elements are related to the 4f shell which is shielded by the outer shells and produces discrete spectra. Going on to discuss luminescence, the authors first discuss the luminescence of pure salts and solutions. The absorption spectra in the infrared visible and ultraviolet regions show

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